

Applicant wishes to remind the Examiner that there are presently 9 independent claims, namely claims 1, 9, 20, 22, 24, 26, 28, 30 and 32. All claims, both dependent and independent, include the limitations contained in claim 1 and should be found allowable if claim 1 is allowable.

Furthermore, all claims are to be read *to the extent that they cover the elected anionic surfactant, namely, C8 to C16 alkyl aryl sulfonic acids and alkali metal and ammonium salts thereof*. Finally, all rejections are addressed *solely* to the subject matter not already covered by Applicant's U.S. patent no. 6,346,279.

Claim 1 is reproduced below:

1. (currently amended) An aqueous disinfecting or sanitizing solution having a pH of from 1 to 7 and *consisting essentially of*:

- i) hydrogen peroxide in a concentration of from 0.01 to 8 wt./wt.% of the solution;
- ii) at least one phosphorus-based acid in a concentration range of from 0.05 to 8 wt./wt.% of the solution;
- iii) at least one anionic surfactant selected from the group consisting of *C8 to C16 alkyl aryl sulfonic acids and alkali metal and ammonium salts thereof*, sulfonated C12 to C22 carboxylic acids and alkali metal and ammonium salts thereof, C8 to C22 alkyl diphenyl oxide sulfonic acids and alkali metal and ammonium salts thereof, naphthalene sulfonic acids and alkali metal and ammonium salts thereof, C8 to C22 alkyl sulfonic acids and alkali metal and ammonium salts thereof, alkali metal C8 to C18 alkyl sulfates, and mixtures thereof, in a concentration range of from 0.02 to 5 wt./wt.% of the solution; and
- iv) the remainder to 100 wt./wt.% water.

The Examiner has withdrawn the restriction requirement regarding the phosphorus-based acid but has maintained the restriction requirement regarding the anionic surfactant. Thus, the following subject matter is under consideration and not already covered by the claims of Applicant's issued patent:

- 1. a pH range of 3 to 7;

2. hydrogen peroxide concentration of from 0.01 to 0.05 w/w %; and
3. all species and combinations of species of phosphorus based acids other than phosphoric acid alone and phosphoric acid in combination with 1-hydroxyethylidene-1,1-diphosphonic acid.

The specific rejections will now be addressed in the order in which they appear in the Office action.

Rejection of claims 1, 4-7, 9, 12-15, 46 and 47 under 35 U.S.C. 102(e)

Examiner has rejected claims 1, 4-7, 9, 12-15, 46 and 47 under 35 U.S.C. 102(e) as being anticipated by U.S. 6,043,209 to Micciche et al. Applicant respectfully submits that the Examiner has not met his burden of establishing that these claims are anticipated.

To be anticipated, each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference (MPEP 2131).

Examiner states that Example 1 (at column 4) anticipates the subject claims. In fact, it does not. Example 1 discloses the following surfactants: sodium lauryl (dodecyl) sulfate, sodium lauroyl sarcosinate, lauramine oxide and C11-15 pareth 7. None of these surfactants belong to the class of surfactants presently claimed and pending in this application, namely, C8 to C16 alkyl aryl sulfonic acids and alkali metal and ammonium salts thereof. Consequently, Examiner has not met his burden of establishing anticipation of the subject claims.

Rejection of claims 1-2, 4-7, 9, 10, 12-15, 18, 20-23, 26, 27, 32, 33, 35-37, 39, 42-44, 46-49, 51, and 54 under 35 U.S.C. 102(b)

Examiner has rejected claims 1-2, 4-7, 9, 10, 12-15, 18, 20-23, 26, 27, 32, 33, 35-37, 39, 42-44, 46-49, 51, and 54 under 35 U.S.C. 102(b) for being anticipated by U.S. 4,518,585 to Greene et al. Examiner states that the surfactant of the Greene et al. solution can be sodium lauryl sulfate or disodium 4-dodecylated oxydibenzenesulfonate. Examiner notes that the latter is equivalent to sulfonated diphenyl oxide. Furthermore, Examiner states that the acid can be any organic or inorganic, e.g. phosphoric acid, and that the pH of 1-3 is readily envisaged by the disclosure of a pH of 1.8 in Example 1 (column 4). The claims under consideration do not cover sodium lauryl

sulfate as a result of the restriction requirement. The other ingredients and factors cited by the examiner are relevant **only** to the patentability of subject matter which was already granted in Applicant's above-referenced U.S. patent. Consequently, Examiner has not met his burden of establishing anticipation of the presently pending claims.

Rejection of claims 1, 4-6, 9, 12-15, 22, 24, 28, 46, 47, 49, 50 and 52 under 35 U.S.C. 102(b)

Examiner has rejected claims 1, 4-6, 9, 12-15, 22, 24, 28, 46, 47, 49, 50 and 52 under 35 U.S.C. 102(b) for being anticipated by WO 98/18894 to Silvaggi et al. Once again, Examiner cites a composition (Example I at page 27-28) which does not anticipate these claims. The composition cited by the Examiner contains sodium alkyl sulfate as the sole anionic surfactant. This surfactant is not one of the presently claimed surfactants due to the restriction requirement and therefore the Examiner has not met his burden of establishing anticipation of these claims.

Rejection of claims 8 and 16 under 35 U.S.C. 103(a)

Examiner has rejected claims 8 and 16 under 35 U.S.C. 103(a) for being obvious over Silvaggi et al. Examiner states that it would be obvious to replace the sodium alkyl sulfate of Example I with dodecyl benzene sulfonate to arrive at the presently claimed solution because Silvaggi et al. teaches the specific interchangeability of the anionic surfactants, alkyl sulfates and alkyl benzene sulfonates. With respect, Applicant disagrees.

To reach a proper determination of obviousness, the examiner must step backward in time and into the shoes of the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination as to whether the claimed invention "as a whole" would have been obvious at that time to that person. Hindsight reconstruction is not permitted (MPEP 2142).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify Silvaggi et al. Second, there must be a reasonable expectation of success. Finally, Silvaggi et al. must teach or suggest all claim limitations. The initial burden is on the examiner to provide some suggestion of the desirability

of doing what the inventor has done. To support the conclusion that the claimed invention is directed to obvious subject matter, either the reference must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the reference: *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985) (MPEP 2142).

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the Applicant's disclosure: *In re Vaeck*, 947 F.2d 488, 20 USPQ 2d 1438 (Fed. Cir. 1991) (MPEP 2143).

Silvaggi et al. teaches compositions for removing soils and stains (e.g. particulate and/or greasy soils, bleachable and enzymatic stains) from carpets (see page 10, line 30 to 36, for example). There is no disclosure of the biocidal properties of the compositions or of the usefulness of the compositions as biocides.

The compositions are based on a peroxygen bleach and a solvent system consisting of an alcohol and a second solvent (page 2, line 20 to page 3, line 4, see also Summary of Invention, page 6, line 10 to 21). These ingredients are stated to be essential (page 7, line 12, page 8, line 9, and page 8, line 21).

Long lists of optional ingredients are recited for their known deterative properties. These include cationic, non-ionic, amphoteric (zwitterionic) and anionic surfactants (page 14, line 9 to 10, for example). Anionic surfactants are stated to be preferred because they contribute to outstanding stain removal and do not stick to carpet thereby reducing resoiling. Phosphonate chelating agents may also be included as optional ingredients (page 21, line 16 to page 22, line 4). The solutions can be any pH (page 13, line 23), though a pH of 4 to 6 is stated to be preferred (page 13, line 25). None of the Examples contained on page 27 to 29 employ members of the presently claimed anionic surfactant class.

The present invention provides disinfecting and sanitizing solutions of enhanced activity. It would not be obvious to arrive at the presently claimed solution from reading Silvaggi et al. Silvaggi et al. employs surfactants as optional ingredients and only for their known deterative

properties. While one might argue that Silvaggi et al. suggests the interchangeability of sulfonate and sulfate surfactants for their deterative properties, there is no teaching or suggestion whatsoever of the interchangeability these surfactants for their disinfecting properties. The person skilled in the art, reading Silvaggi et al., would not reasonably expect that substituting the alkyl sulfate surfactant with the presently claimed sulfonate surfactant would produce a germicidal solution having increased activity. Thus, Examiner has not met the second criterion mentioned above for establishing a *prima facie* case of obviousness. The germicidal activity of the presently claimed solution will be further discussed below.

Rejection of claims 1, 2, 4-10, 12-40 and 42-54 under 35 U.S.C. 103(a)

Examiner has rejected claims 1, 2, 4-10, 12-40 and 42-54 under 35 U.S.C. 103(a) for being obvious in view of U.S. 5,900,256 to Scoville, Jr. et al, U.S. 4,637,899 to Kennedy, Jr., and Block, "Disinfection, Sterilization, and Preservation" (Lea & Febiger, 4th ed., 1991, Philadelphia). Applicant included a discussion of these references in the previous response and that discussion is reproduced below for Examiner's ease of reference.

Discussion of Prior Art

Scoville et al. teaches a hydrogen peroxide disinfectant solution which is stable over long periods of time and has anti-corrosive properties (page 3, lines 5-9). It is not concerned with providing a hydrogen peroxide disinfectant formulation with enhanced activity. The formulation contains hydrogen peroxide in an amount of from about 0.5 to about 50 w/w %, an organic or inorganic acid in a concentration of from about 0.001 to about 10 w/w %, and a corrosion inhibitor comprising from about 0.1 to about 30 w/w % of 1,2,3-benzotriazole and alkylene glycol.

Scoville et al. does not teach that using the selected anionic surfactants of the present invention will result in an unexpected boost in the disinfection ability of the base composition. In fact, this reference teaches the use of surfactants as being optional (see page 7, lines 23-30). If used, the surfactants must be compatible with hydrogen peroxide in acidic aqueous media, that is, they must be relatively stable against oxidation and decomposition in the presence of acidic aqueous hydrogen peroxide. Although long lists of surfactants are recited which include some of the

anionic surfactants presently claimed, it would not be obvious to select the presently claimed anionic surfactant from these lists absent some teaching or suggestion to do so.

Block has been cited to establish that hydrogen peroxide, acids and surface active agents are known to possess individual disinfecting properties (pp. 167-180, 256-271). However, based on the published data relating to the germicidal properties of individual components, one would not expect the rate of activity demonstrated by solutions according to the present invention.

Kennedy, Jr. was cited to show that solubilizing alcohols such as isopropanol and a surfactant such as an alkyl sulfonated diphenyl oxide are known corrosion inhibitors. This reference is therefore not pertinent to the patentability of claim 1 and will not be discussed for the purpose of this response.

"Consisting Essentially Of"

Examiner states that the burden is on the Applicant to establish that the additional ingredients disclosed in Scoville et al. materially affect the basic and novel properties of the invention. Applicant submits that it has already met this burden. The example formulations of Scoville et al. (see compositions I and II in column 8, Example 1) employ peracetic acid. These formulations were tested on *Bacillus subtilis var. niger* spores. Peracetic acid is a well known spore killer and the efficacy data presented in tables 1 to 3 are not surprising. See the article by Baldry, M.G.C., "The bacterial, fungicidal and sporicidal properties of hydrogen peroxide and peracetic acid" (1983), Journal of Applied Bacteriology, 34, 417-423, and especially page 418 and 421 thereof (copy provided previously). See also Block, Chapter III, Peroxygen Compounds, pp. 174-176 (copy enclosed). Thus the presence of peracetic acid would materially affect the disinfecting properties of the present invention. A material effect is one which is a material change. There need not be a reduction in disinfecting ability, an increase can also constitute a material effect.

Synergy of Invention

While the disinfecting properties of individual ingredients of the present invention are known, one skilled in the art, reviewing the cited references, would not expect the synergy, i.e. boost in germicidal activity, achieved by the presently claimed solution. Evidence of this synergy is

contained in the Affidavit of Jose Ramirez sworn on March 31, 2003 (the "Ramirez Affidavit"). Applicant contends that the Examiner has misconstrued this evidence in failing to appreciate that it is indeed commensurate in scope with the present claims (as will be further discussed below). Nonetheless, Applicant hereby encloses further evidence of non-obviousness consisting of the affidavit of Navid Omidbakhsh sworn November 9, 2003 (the "Omidbakhsh Affidavit").

Example A shows that there is a synergy between the dodecyl benzene sulfonic acid and hydrogen peroxide in solutions A1, A4 and A5. These results were sufficient to rebut the presumption that the claims of the parent application were *prima facie* obvious over the cited references. Examiner will recall that the claims of the parent application were restricted so as to be commensurate in scope with the evidence of non-obviousness contained in Example A.

The results for solutions B1, B2 and B3 in the Ramirez Affidavit and B4, and B5 in the Omidbakhsh Affidavit expand on the results of Example A and show that the synergy demonstrated by solutions A1, A4 and A5 is maintained for different phosphorus-based acids. Each of solutions B1, B2, B3, B4 and B4 contain hydrogen peroxide and dodecyl benzene sulfonic acid for which the synergy has already been demonstrated in Example A. Thus, these solutions likewise exhibit a synergistic effect as confirmed by comparing their germicidal results to the results for solutions A1, A4 and A5. ***There is no requirement that the germicidal results for solutions B1 to B5 be surprising over Applicant's own results for solutions A1, A4 and A5 since such is not prior art for the claims of this application.*** Furthermore, the Examiner has not cited any references to suggest that the results for B1 to B5 are expected, given the results contained in Example A.

The results for solutions D1, D2 and D3 in the Ramirez Affidavit demonstrate that the synergy demonstrated by solutions in Example A exists at varying pH values. The results for solutions D4 and D5 in the Omidbakhsh affidavit demonstrate that removal of either the hydrogen peroxide or the dodecyl benzene sulfonic acid results in an unexpected drop in germicidal activity at a pH value of 6, thus further demonstrating the synergy between the hydrogen peroxide and the dodecyl benzene sulfonic acid. Again, all results are to be interpreted having the results of Example A in mind, which results are not prior art.

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The Ramirez and Omidbakhsh Affidavits lend support for the patentability of subject matter extending beyond the subject matter of Applicant's issued patent. Examiner is invited to review Applicant's previous response and the Ramirez and Omidbakhsh affidavits for further details.

The Examiner is requested to telephone the undersigned if any further information is needed to resolve the issues.

Again, reconsideration and allowance of this application are respectfully solicited.

Respectfully Submitted,
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By: 

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Date: November 10, 2003

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Enclosure(s):

- Affidavit of Navid Omidbakhsh, sworn on November 9, 2003
- Block, "Disinfection, Sterilization, and Preservation" (Lea & Febiger, 4th ed., 1991, Philadelphia), Chapter III, Peroxygen Compounds, pp. 174-176.